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Report

Taylor. Conditions of diet and nutrition in Camp at Ruhleben

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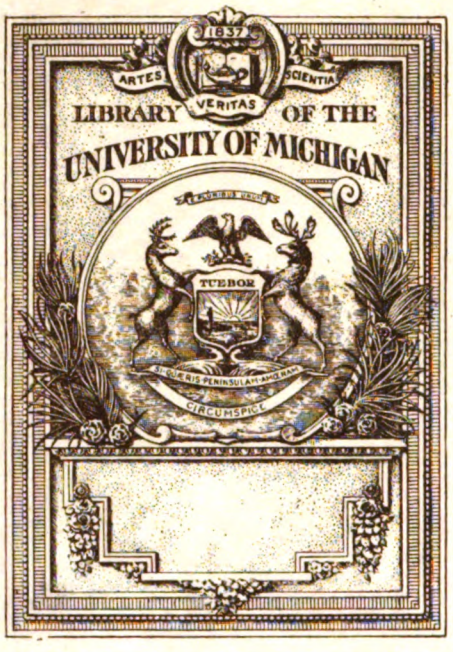

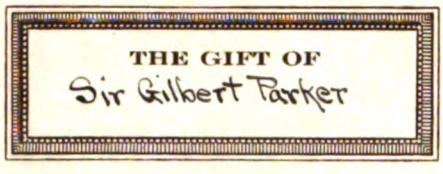

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MISCELLANEOUS. No. 18 (1916).

REPORT

BY

DOCTOR A. E. TAYLOR

ON THE

CONDITIONS OF DIET AND NUTRITION IN THE INTERNMENT CAMP AT RUHLEBEN

RECEIVED THROUGH THE

UNITED STATES AMBASSADOR.

Presented to both Houses of Parliament by Command of His Majesty.
June 1916.

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CATALOG DIVISION

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Report by Dr. A. E. Taylor on the Conditions of Diet and Nutrition in the Internment Camp at Ruhleben, received through the United States Ambassador.

No. 1.

Mr. Page, United States Ambassador in London, to Sir Edward Grey.—
(Received May 13.)

THE American Ambassador presents his compliments to His Majesty's Secretary of State for Foreign Affairs, and has the honour to transmit, herewith enclosed, a copy of a letter he has received from the Embassy at Berlin, dated the 3rd instant, enclosing a copy of a report by Dr. A. E. Taylor concerning the conditions of diet and nutrition in the British civilian camp at Ruhleben.

American Embassy, London,
May 12, 1916.

Enclosure 1 in No. 1.

Mr. Gerard to Mr. Page.

Sir, *American Embassy, Berlin, May 3, 1916.*

I HAVE the honour to transmit herewith, for the information of the British authorities, a copy of a report, dated the 1st instant, which has been prepared by Dr. A. E. Taylor, in regard to the conditions of diet and nutrition in the camp of the interned British civilians at Ruhleben.

I have, &c.
(For the Ambassador),
JOHN B. JACKSON.

Enclosure 2 in No. 1.

Dr. Taylor to Mr. Gerard.

Sir, *May 1, 1916.*

I HAVE the honour to present the following report dealing with the conditions of diet and nutrition in the camp of the interned British civilians at Ruhleben.

In order to formulate an objective opinion of a diet and its influence upon the nutrition of those who subsist upon it, it is necessary that the dietetic survey be extended over a number of days, and the physical condition of the subjects observed over a longer period. I have visited the camp at Ruhleben during ten days, spending a number of hours there each day. The diet for one week has been studied qualitatively and quantitatively. I have inspected, and myself tasted, all of the articles of diet served within this period. The quantities of the several foodstuffs served are weighed by four volunteer captains-of-kitchen, upon whom authority to do this has been conferred by the military authorities of the camp. The weights thus determined are accepted by the military authorities. In the case of the larger number of the most important articles of food served during this week, I have myself witnessed the weighings. I have followed the preparation of the food and have, during the period of survey, eaten the midday meal in the quantities allotted to each man. I have witnessed each day the giving out of the food of the midday meal to the men of the several barracks, in order to determine the number of men who came to obtain the food. It has not been possible in an accurate manner to determine the number of men who come to "fetch" the breakfast and evening meal, though it is known that this number never exceeds that of the men who partake of the midday meal.

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From the standpoint of their relation to the diet the men confined in Ruhleben may be divided into five groups :—

(*a.*) The so-called pro-German group. These men, who are technically British subjects, have lived in Germany for so many years that they are German in tastes, sentiments, and partly also in political convictions. Since, however, they retained technical British citizenship in order to avoid German military duty, they are now regarded as British and therefore interned. These men receive no food supply from outside of Germany. They receive limited food supplies from German sources outside the camp. Since their tastes in food are practically German, the problem of feeding them corresponds to that of feeding German soldiers.

(*b.*) A group roughly termed Jewish. These men receive no supplies from outside of Germany; they receive limited supplies from outside the camp. They may, in general, be classified with the first group, except for such restrictions in diet as are imposed upon them by their religion.

(*c.*) The third group consists of British subjects who, for one reason or another, receive no packages from Great Britain, and are thus practically dependent upon the rations supplied by the German authorities. It is difficult to form a correct judgment of the number in this group; it probably includes several hundred.

(*d.*) The fourth group consists of those whose names are upon the mailing lists of one or another of the numerous trade-unions, eleemosynary organisations, lodges, relief societies, or other associations. The members of this group receive large numbers of packages, and in numbers this is by far the largest group in the camp.

(*e.*) The last group includes the men who receive from their own families and friends shipments of food from Great Britain. There is a relief fund available for all men in the camp who choose to apply for it, with the understanding that the money is not an outright gift, but constitutes a loan to be repaid at some future time by the borrower. A number of men, who otherwise receive no subsistence from outside, do not regard it as proper to accept this relief money, just as they do not regard it as proper to send in their names to any of the organisations or associations engaged in sending subsistence to British subjects imprisoned in Germany. In other words, there are men in the camp who voluntarily subsist upon the camp rations alone, just as do the members of the so-called pro-German group.

The diet of the camp at Ruhleben is, in general, fashioned after the monthly "Bekostigungszettel" ("Speiseplan") supplied by the authorities and based upon the dietetic standards of Professor Backhaus. The food chart for the month of March is appended to this report.* In part, however, the food supplied to Ruhleben has been shifted from the basis established by the authorities.

The physiological criteria of a diet are twofold: the first, fundamental and basal; the others, secondary, and of greater or less importance, depending upon the type of individuals concerned. The fundamental criteria of a diet are based upon the contemplation of the human subject as an animal body—a living machine to whom the biological application of the laws of thermo-dynamics find direct bearing. The secondary criteria of a diet are related to the habits, customs, tastes, and idiosyncrasies of the subjects under consideration and to the degree of refinement or specialisation of their nervous systems.

Contemplating a diet simply from the viewpoint of the subsistence of an animal body, a complete, sufficient, and normal diet must fulfil six desiderata :—

(*a.*) It must contain protein sufficient in amount and representative in component amino-acids to maintain the tissues and cells of the body in a state of normal composition and function. The amount of protein required for healthy male subjects (not engaged in hard work) was previously fixed at from 100 to 120 grammes per day for an average body of 75 kilog. weight. These figures were established largely by German investigators. Within the last fifteen years, more carefully conducted and extensive investigations have indicated that the amounts of protein thus specified are unnecessarily high. It may be stated that 70 to 90 grammes of protein per day are fully competent to maintain normal nutrition in the adult male (not engaged in hard work), provided that the proteins offer the body all the needed amino-acids and that the diet is rich in carbohydrate.

(*b.*) The diet must contain an amount of fuel sufficient to furnish at least 30 calories per kilogramme per day. This fuel ought to be largely in the form of carbohydrate. The calories specified are needed for the body at rest or under light exercise

* See Enclosure No. 3.

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only. If the body works, the input of fuel must rise to a value of 3,000 or more calories, depending upon the severity of the work. The rule of the German authorities dealing with military prisoners runs at present to the effect that prisoners who work are to receive 10 per cent. more in calories than prisoners living in camp.

(*c.*) The diet must contain a certain amount of native fat. Extensive investigations in the nutrition of growing animals have indicated that a certain minimal fat-content is indispensable in a diet. It is not known just how much fat is required to cover this factor; and we are therefore not in a position to fix the minimal fat-content of a normal diet. Roughly speaking, it is believed that a ration should contain at least 25 to 50 grammes of fat per day. The diet sheet for April contains an average of 30 grammes per day; in other words, the official prisoners' ration in Germany contains no more than the minimal amount of fat. The investigations above referred to (dealing with the nutrition of animals in the period of growth) do not offer a basis for judgment as to the minimal amount of fat required for the nutrition of adults. It is, indeed, more than possible that the indispensable factor in fats does not lie in the tripalmatine, tristearine, and trioleine therein contained, but in other components (whose nature is not yet clearly understood) which are present in the various native fats. General medical experience supports the view that nutrition is better maintained upon protein, carbohydrate, and fat than upon protein and carbohydrate alone.

(*d.*) The diet must contain the various salts required in the body.

(*e.*) The diet must contain certain substances of unknown chemical nature that are at present grouped under the term vitamins, and which are found especially in vegetables and in the coverings of grains. It is possible that the indispensable factor in fats previously discussed is to be classed with the vitamins, when considered from the standpoint of a diet.

(*f.*) A diet must not consist entirely of preserved or conserved foodstuffs. A certain proportion of the articles of diet ought to be either freshly cooked or consumed raw.

The second criteria of a diet are much more difficult to elucidate and evaluate than are the basal requirements already stated. In a general sense, it is common observation that, taking men as they are, a diet to be entirely adequate must take into some account the habits, tastes, and customs of the subjects. As a rule, animals will eat the same food day after day without untoward results—in other words, behave like machines. Nevertheless, pampered house pets, trained sporting dogs, and race-horses often require variation in the diet, and sometimes even to a surprising extent, in order to maintain normal nutrition. There are many human beings (and, indeed, in many countries whole groups of the population) who subsist month after month through years upon a simple and almost unvaried diet, thus behaving again like machines. As one ascends the economic scale of society (from the standpoint of education and means, and particularly as a result of the specialisation of life in a modern city), the monotony of an unvaried diet will sooner or later lead to reduction in the appetite and to lowering of the digestive powers, and result in deterioration in nutrition. The highly-trained nervous organism may become stale upon a routine diet as quickly as upon a routine of drudgery. The previous habits of the individual are of importance in this connection. A diet in itself monotonous will have to a very much less extent the effect of monotony, if that diet be the one to which the subject has been accustomed. On the other hand, a strange diet of an unvaried nature will provoke an unusual degree of palling in an adult man, because it runs counter to his established habits. It was, therefore, to be expected that a prison ration applied to foreigners would be less well tolerated from every point of view than the same diet applied to domestic prisoners. The mere fact of imprisonment is also of influence. A diet that would be tolerated if the subject were at liberty, may become intolerable under conditions of imprisonment. There is a large personal equation operative in this direction. The soldier embued with a high sense of his value to his country and of the justice of his cause will endure a monotonous diet that would not be endurable in the prisoner overwhelmed with disappointment and crushed with sorrow. To men of highly-refined nature and specialised nervous system, such as the artist and the scholar (of which classes there are many representatives in Ruhleben), a ration that would be found entirely satisfactory in institutional life would in the long run prove incompetent.

The following tables present the figures for the various articles of diet served to the prisoners in Ruhleben during the seven days comprised in this survey.* As stated, the figures for the midday meal only are accurately known. Nevertheless, enquiry and

* See Enclosure No. 4.

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observation have made it quite certain that if the same figures be applied to the other two meals they will be substantially correct. The number of men who fetched the food (to use the current camp expression) on the seven days of the survey were as follows: 2,258, 1,940, 2,019, 2,480, 2,235, 1,676, 2,380. The total number interned is 3,700.

In the first column of the table are set for each day the articles of food and the weights (in kilogrammes unless otherwise specified). In the second column are stated for each day and for each article of food the contents in protein, fat, and carbohydrate. In the third column are the figures for the total number of calories in the food served the entire camp on the day specified. In the fourth column are stated for each day the number of grammes of protein, fat, and carbohydrate and their value in calories that would have been available to each prisoner had the entire number of prisoners (3,700) participated in the taking of food. In the last column are stated for each day the number of grammes of protein, fat, and carbohydrate, and their value in calories, that were actually consumed by the known number of men who participated in the noonday meal, the same figure being applied to the morning and evening meal. At the bottom of the sheet the average figures are stated, and it is best to consider these rather than the daily individual figures, which present rather striking fluctuations, since the varying composition of foodstuffs and the varying number of men taking food both operate to produce irregularities. From the averages it is seen that for the number of men who partook of the camp rations the average daily input for the week was 99 grammes of protein, 25 grammes of fat, and 525 grammes of carbohydrate, corresponding to 2,740 calories. If all the men in the camp had taken their numerical share of the food offered, the average daily input per man would have been 60 grammes of protein, 13 grammes of fat, 308 grammes of carbohydrate, corresponding to 1,590 calories.

The "Speiseplan" for the prisoners of war prepared by Professor Backhaus provides daily for prisoners not engaged in work about 80 to 85 grammes of protein, 30 grammes of fat, and 500 grammes of carbohydrate, corresponding to about 2,700 calories. It is clear that for the men who took the ration it was quantitatively adequate, except for the difference in fat, even if the men who took the ration had subsisted entirely upon it, which was, however, not true of two-thirds of the men who partook of the food. On the other hand, it is equally clear that the food provided and served during the week of this survey was not sufficient in any direction to provide nourishment for the 3,700 men concerned, had they been entirely dependent upon it. Even before these figures were available I had become convinced that the food shipped in from the outside corresponded in unit value to from one-half to two-thirds of the food supplied by the camp authorities. It is difficult for the men engaged in the kitchens, though they are very competent, to judge in advance of the number of men who will apply for food, and yet it is necessary for them to attempt to do so. If fewer men come the kitchen hands aim to serve larger portions; if an unusual number come the kitchen men aim to serve smaller portions, in order that all who appear may have their share and yet no cooked food be left over, since it cannot be laid aside for future use. Fresh fish was served on three days of this survey. On the second day there was enough fish to provide a portion for all who applied. On the first and third days, however, the supply ran out with 100, and with 250 men still in line. These men were then provided with tinned fish, which many of them refused.

The figures for bread input require explanation. In the first column is stated under bread (unlimited). Prior to the week of this survey the bread ration was fixed at 300 grammes. Since certainly less than 1,000 men took the black bread at all, the authorities announced that those men who wished this bread could have it in unlimited amounts. Observation of the added amounts taken made it clear that on an average not over 400 grammes per day were wanted; the bread figure given for each day, 1,500 kilog., corresponds to 400 grammes per day for each man. Now since this total amount of bread is included in each day's ration, it is apparent that the end-figures do not express the exact result. In the figures given for the input of the men who fetched the food is included an amount of bread corresponding to 400 grammes daily for each man in the entire camp; and since at no time did over two-thirds of the men appear at the kitchens for the noon-day meal, the figures would imply that these two-thirds ate the entire bread ration, which would thus amount to about 600 grammes per day. It is very certain that they did not do this; therefore the figures given for input for the men who took the food are somewhat too high, though not enough to vitiate the conclusion that the food offered was ample and sufficient in itself to maintain the nutrition of the stated number of men, had they subsisted upon it alone, viewed from the standpoint of animal physiology. Factors (*a*), (*b*), and (*c*)? as above stated were quantitatively and qualitatively fulfilled for the average number of men

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taking the food: factors (*d*), (*e*), and (*f*) were fulfilled. For the total number of men in the camp the food furnished by the camp authorities was insufficient in protein, fat, and carbohydrate.

Viewed from the standpoint of the secondary criteria of a diet, we may judge of the efficiency of a ration by observing over a prolonged period of time the body weights, the colour, and other signs of general health, and the condition of the digestive track and of the nervous system. Obviously, it is necessary to evaluate the influence of other factors. Confinement and exercise are two such factors. The quarters in Ruhleben do not impose any such degree of confinement as could be termed in itself detrimental to health. Owing to the ample space provided for the prisoners, there is full opportunity for exercise in the playing of games or in walking. The mere fact of imprisonment, the curtailing of personal liberty, the enforced absence from business with its attendant losses, deprivation of family association, and the resentment against confinement, all tend to mitigate against the inherent effectiveness of the diet, bodily freedom, and exercise. The British dislike the German cooking; they object in particular to the German cooking as displayed under the exigencies of camp life. It is clear, however, from conversations with even the most violently protesting prisoners, that their objections do not apply materially to the foodstuffs, and do not mean to imply that the food as cooked is unfitted for human consumption. They simply mean that it is so different from the food to which they are accustomed that they cannot learn to regard it with anything else than distaste. Replies to widespread questioning of men in normal flesh indicated that loss of weight had not been frequently observed; indeed, some men had gained in weight. On the other hand, many prisoners who were obese had lost weight, and the diet is obviously not calculated to produce obesity. I have been careful to observe the appearances of the men who are known to subsist largely or entirely upon the camp ration. For the most part these men live under conditions in one way less favourable to health than those of the British subjects from outside Germany, in that they participate far less in outdoor sports. On the other hand, they probably suffer less from the resentment of confinement. I was not able to observe that the nutrition of the men who subsisted largely or entirely upon the camp ration, was any lower than that of the men who subsisted partly, or entirely, upon supplies sent from abroad. Naturally the members of the so-called pro-German group do not possess the aversion to the German styles of cooking. Walking about the camp day after day I have met with a considerable number of men who look under-nourished, but this in itself would not constitute an indication that the diet was inadequate unless organic disease (not the result of sub-nutrition) could be excluded.

With one exception, the different foodstuffs have been found to be of satisfactory quality. The camp possesses a stock of "Brathering" in large tins. Upon one occasion I witnessed the opening of seventeen of these tins. Five of the tins were distended with gas, which rushed out when the tins were punctured. The contents of these tins were found to be in a state of advanced putrefaction. The contents of the other twelve tins were not putrefied, but could not be regarded as in satisfactory condition. I believe that this lot of herring should be condemned. The cheese and cocoa were not of high-grade, but were unspoiled. The margarine was not a high-grade product, but was sweet. Fresh fish was served during three days of this survey and was of excellent quality. The potatoes were of good grade. The bread corresponded in quality, texture, and appearance with the black bread served in the ordinary beer restaurant in Berlin. The Englishmen dislike this bread and, practically speaking, eat none of it.

The supplies received from abroad consisted of 800 kilog. of bread daily and varying amounts of butter or margarine, tinned British army-ration, corned beef, sugar, cakes, biscuits, tea, jam, honey, bacon, and various titbits. It has been, of course, impossible to determine, even in an approximate manner, the amounts of these different articles. I have, however, attempted to determine, in an approximate manner at least, the amount of butter and margarine brought in from Great Britain, since it is in fat that the German ration is particularly poor. Enquiry has led to the conclusion that the shipments of cakes, sweets, and titbits were disproportionately large, and of fats surprisingly small. I do not believe the amount of butter and margarine shipped into the camp would provide more than 15 grammes per man per day. In other words, the food shipped in from Great Britain, like the food provided by the German authorities, is poor in fat and rich in starch. There is marked unevenness in the distribution of the supplies received from outside. Some men receive far more than they can consume, having placed their names upon several different mailing lists in Great Britain. Others receive only a moderate supply, are careful and conscientious in the use of their supplies, and divide and exchange with other men. Several hundred men receive

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nothing, or next to nothing, and do not believe it proper to accept food from their fellow-prisoners. It is clear that there is in Great Britain a complete, and from the standpoint of the prisoners in Ruhleben most lamentable, lack of organisation in the selection of foodstuffs and distribution of food packages for these prisoners. It is again the old story of unorganised charity being qualitatively inefficient and quantitatively wasteful.

Considered objectively as a problem of nutrition, without any reference to extraneous circumstances, the diet of the prisoners in Ruhleben would be improved, and at the same time made much more satisfactory to the men themselves and, I am convinced, at no greater outlay than at present, if the following recommendation could be adopted.

Food is now furnished these men from two sources: from Germany and from Great Britain. Considered nutritionally, these two sets of supplies should complement each other to the end of securing a rounded and satisfactory ration. In order to do this, the sending of supplies from Great Britain should be organised and controlled; and the German authorities should cease to attempt to supply a balanced ration with the money they have determined to expend for this purpose, devoting their outlay entirely to certain articles of food. The chief defects in the diet are lack of fat and inability to eat the German bread. The men also complain that the potato ration is too low. Disregarding the supplies sent from Great Britain by the families and friends of the individual prisoners, the supplies sent from Great Britain are furnished by trade-unions, lodges, Red Cross societies, relief organisations, social service societies, and by charitable individuals, who have banded themselves into groups for this purpose. Several of these bodies send their supplies to any prisoner who will send in his name. There is no attempt on the part of the various senders to prevent duplication in the names, to determine what is most needed, or to make sure that there is no waste. As stated, many men receive nothing. If the sending of supplies from Great Britain could be organised and the money spent, not in accordance with the ideas of the generous but untrained donors, but instead in accordance with the known laws of nutrition, and also from the standpoint of the unit food value per shilling expended, all the interned men would receive an equal share, there would be no waste, the men would receive what their diet most needs, and there would be a higher return in food value for the money expended. Such an organisation in Great Britain would lead to the same efficiency that is attained, for example, in the feeding of the British soldiers in France. It would be necessary to have the distribution of these supplies (which would be sent largely in block and bulk), supervised by some neutral agency, *e.g.*, the American Embassy. This arrangement would have the additional advantage of simplifying the transportation and distibution of the food from Great Britain.

Nothing in such an arrangement would negate the right of the sending of personal parcels from friends and connections in Great Britain or elsewhere; it would apply solely to the money now being expended upon an impersonal basis. On the other hand, the money now appropriated by the German authorities for subsistence in Ruhleben would be expended for certain articles of food only. In order to put such a recommendation into concrete form, the following general arrangement in diet is suggested. The figures have been prepared for 3,500 men, since it is my understanding from the camp authorities that some 200 men of the so-called pro-German group, who have signified their attention of acquiring German citizenship after the war, are to be removed from Ruhleben.

Suggested outlay from the German side, per man per day:—

Three days a week, 125 grammes fresh meat; two days a week, 200 grammes fresh fish; one day a week, 150 grammes tinned corned beef; one day a week, 150 grammes smoked fish. Each day in the week 1 kilog. potatoes and 300 grammes of a root or leaf vegetable.

Suggested outlay from the British side per man per day:—

Each day in the week, 400 grammes white bread, 30 grammes butter or magarine, 50 grammes bacon, 50 grammes sugar, 30 grammes jam or conserves, 30 grammes Quaker oats, and 30 grammes condensed milk; tea and coffee as needed. Such a diet would contain 80–90 grammes of protein, about 65 grammes of fat, and 425 grammes of carbohydrate, and would yield about 2,600 calories. Such a diet would contain the usual and desirable amount of fat, it would conform to the tastes of the prisoners, it would provide the interned men with certain desired articles which the German authorities do not provide. In general, such a plan could probably be carried out at no greater costs to either side, all factors considered, than are at present involved.

I have, &c.

A. E. TAYLOR.

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Enclosure 3 in No. 1.

(Translation.) FOOD CHART, MARCH 1916.

Ministry of War. Quartering Department: Feeding of Prisoners.

Recommended as example of suitable diet for Russians.

Foodstuffs. — *mo.* = morning. *mi.* = midday. *e.* = evening.	Percentage Contents.					Total Contents.				
	Protein.	Fat.	Carbo-hydrate.	Calories.	Price per Kilog. in Pfennigs.	Protein.	Fat.	Carbo-hydrate.	Calories.	Cost in Pfennigs.
Sunday.						Gr.	Gr.	Gr.		
300 gr. bread	4·3	0·4	47·3	213·7	..	12·9	1·2	141·9	641·1	..
mo. Coffee with sugar, jam—										
4 gr. coffee	..	..	..	..	400	..	..	..	..	1·6
7 gr. chicory	..	..	..	..	52	..	..	..	..	0·4
20 gr. sugar .. .	..	..	99·0	398·4	46	..	..	19·8	79·7	0·9
50 gr. jam	0·5	0·2	58·1	235·3	55	0·3	0·1	29·1	117·7	2·8
mi. Joint with vegetables and potatoes—										
120 gr. beef (20 gr. bones) ..	19·4	7·1	..	159·8	240	19·4	7·1	..	159·8	28·8
750 gr. potatoes	1·5	0·2	20·0	89·0	9	11·3	1·5	150·0	667·5	8·1
300 gr. cabbage or sauerkraut..	1·3	0·2	4·2	24·9	5	3·9	0·6	12·6	74·7	1·8
e. Potatoes in jackets with cheese, tea—										
600 gr. potatoes	..	..	..	..	..	9·0	1·2	120·0	534·0	6·5
100 gr. cheese	33·5	11·9	4·1	289·0	235	33·5	11·9	4·1	289·0	23·5
2 gr. tea (half mate, half black)	..	..	..	..	325	..	..	..	..	0·7
10 gr. lump sugar	..	..	..	..	49	..	..	9·9	39·8	0·5
						90·3	23·6	487·4	2,603·3	75·6
Monday.										
300 gr. bread	..	..	..	..	..	12·9	1·2	141·9	641·1	..
mo. Chocolate—										
20 gr. cocoa	9·3	18·6	19·3	248·3	180	1·9	2·7	3·9	49·7	3·6
30 gr. sugar	..	..	..	..	..	..	..	29·7	119·5	1·4
10 gr. farina	0·6	..	78·3	316·2	42	0·1	..	7·8	31·6	0·4
mi. Residue dish with potatoes and vegetables—										
60 gr. beef (10 gr. bones) ..	..	..	..	..	..	9·7	3·6	..	79·9	14·4
40 gr. nutritious residue ..	46·4	2·8	20·8	331·9	147	18·6	1·1	8·3	132·8	5·9
750 gr. potatoes	..	..	..	..	..	11·3	1·5	150·0	667·5	8·1
300 gr. turnips	0·7	0·2	5·5	27·2	5	2·1	0·6	16·5	81·6	1·8
10 gr. fat	0·5	84·5	0·4	787·3	280	0·1	8·5	..	78·7	2·8
e. Barley soup, tea—										
50 gr. pearl barley	6·8	1·1	68·1	305·4	65	3·4	0·6	34·1	152·7	3·3
50 gr. soya meal	37·2	2·8	28·5	319·7	70	18·6	1·4	14·3	159·9	3·5
500 gr. potatoes	..	..	..	..	..	7·5	1·0	100·0	445·0	5·4
10 gr. fat	..	..	..	..	..	0·1	8·5	..	78·7	2·8
5 gr. seasoning	..	..	..	..	250	..	..	..	..	1·3
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						86·3	30·7	516·4	2,758·5	55·9
Tuesday.										
300 gr. bread	..	..	..	..	..	12·9	1·2	141·9	641·1	..
mo. Soya soup—										
35 gr. soya meal	..	..	..	..	..	13·0	1·0	10·0	111·9	2·5
60 gr. potato flour	3·5	0·1	65·9	281·3	38	2·1	0·1	39·5	169·0	2·3
5 gr. fat	..	..	..	..	..	..	4·2	..	39·4	1·4
mi. Fish with potatoes—										
150 gr. dried cod	27·1	..	..	130·9	86	40·7	..	..	196·4	12·9
750 gr. potatoes	..	..	..	..	..	11·3	1·5	150·0	667·5	8·1
50 gr. onions	..	..	..	..	12	..	..	.	..	0·7
20 gr. fat	..	..	..	..	..	0·1	16·9	0·1	157·4	5·6
e. Porridge with fruit—										
100 gr. maize groats.. ..	6·6	0·6	74·1	334·4	70	6·6	0·6	74·1	334·4	7·0
10 gr. skim milk powder ..	29·0	0·5	48·1	336·3	230	2·9	0·1	4·8	33·6	2·3
30 gr. sugar	..	..	..	..	..	..	..	29·7	119·5	1·4
50 gr. dried fruit .. .	1·8	..	48·5	201·5	100	0·9	..	24·3	100·8	5·0
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						90·5	25·6	484·3	2,610·8	50·4

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Foodstuffs. — *mo.* = morning. *mi.* = midday. *e.* = evening.	Percentage Contents.					Total Contents.				
	Protein.	Fat.	Carbo-hydrate.	Calories.	Price per Kilog. in Pfennigs.	Protein.	Fat.	Carbo-hydrate.	Calories.	Cost in Pfennigs.
						Gr.	Gr.	Gr.		
Wednesday.										
300 gr. bread	..	..	..	..	..	12·9	1·2	141·9	641·1	..
mo. Maize flour soup—										
50 gr. maize flour . ..	8·0	2·2	69·2	335·7	60	4·0	1·1	34·6	167·9	3·0
30 gr. flour	8·4	1·0	66·6	316·3	35	2·5	0·3	20·0	94·9	1·1
mi. Salted meat with vegetables and potatoes—										
120 gr. salted meat (20 gr. bones)	18·3	7·0	..	153·8	180	18·3	7·0	..	153·8	21·6
750 gr. potatoes	..	..	..	..	..	11·3	1·5	150·0	667·5	8·1
40 gr. dried vegetables ..	10·5	0·7	44·2	233·7	183	4·2	0·3	17·7	93·5	7·3
e. Potatoes in jackets, herrings, tea—										
600 gr. potatoes	..	..	..	..	..	9·0	1·2	120·0	534·0	6·5
150 gr. herrings	18·3	15·4	1·0	237·7	75	27·5	23·1	1·5	356·6	11·3
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						89·7	35·7	495·6	2,749·1	60·1
Thursday.										
300 gr. bread	..	..	..	..	..	12·9	1·2	141·9	641·1	..
mo. Chocolate, *cf.* Monday ..	..	..	..	..	..	2·0	2·7	41·4	200·8	5·4
mi. Residue dish with potatoes and vegetables, *cf.* Monday	..	..	..	..	..	41·8	15·3	174·8	1,040·5	33·0
e. Barley soup, tea—										
40 gr. bones	..	15·0	..	139·5	..	..	6·0	..	55·8	..
50 gr. barley groats ..	..	..	..	..	..	3·4	0·6	34·1	152·7	3·3
50 gr. soya meal	..	..	..	..	..	18·6	1·4	14·3	159·9	3·5
500 gr. potatoes	..	..			..	7·5	1·0	100·0	455·0	5·4
5 gr. seasoning	..	..	..	..	..	..	..	..	..	1·3
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						86·2	28·2	515·4	2,735·6	53·1
Friday.										
300 gr. bread	..		..	..	..	12·9	1·2	141·9	641·1	..
mo. bean flour soup—										
50 gr. bean flour	19·6	0·9	56·0	326·7	80	9·8	0·5	28·0	163·4	4·0
50 gr. potato flour	..	..	..	..	..	1·8	0·1	32·9	140·7	1·9
5 gr. fat	..	..	..	..	..	..	4·5	..	39·4	1·4
mi. fish, with potatoes and sauce—										
200 gr. salt fish	26·3	0·3	..	130·0	63	52·6	0·6	..	260·0	12·6
750 gr. potatoes	..	..	..	..	..	11·3	1·5	150·0	667·5	8·1
20 gr. fat	..	..	..	..	..	0·1	16·9	0·1	157·4	5·6
25 gr. horse-radish	2·0	0·2	13·4	64·9	115	0·5	0·1	3·3	16·2	2·9
e. Porridge with jam, tea—										
100 gr. maize groats	..	..	..	..	..	6·6	0·6	74·1	334·4	7·0
10 gr. skim milk powder ..	..	..	..	..		2·9	0·1	4·8	33·6	2·3
30 gr. sugar	..	..	..	..	..	..	..	29·7	119·5	1·4
50 gr. jam	..	.	..	..	..	0·3	0·1	29·1	117·7	2·8
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						98·8	26·2	503·8	2,733·7	51·2
Saturday.										
300 gr. bread	..	..	..	..	..	12·9	1·2	141·9	641·1	..
mo. Meal soup, *cf.* Wednesday ..	..	..	..	..	..	6·5	1·4	54·6	262·8	4·1
mi. Beans with potatoes and vegetables—										
150 gr. beans peeled	20·7	0·4	44·5	281·1	80	31·1	0·6	66·8	421·7	12·0
750 gr. potatoes	..	..	..	..	..	11·3	1·5	150·0	667·5	8·1
300 gr. carrots	..	..	..	..	10	2·1	0·6	16·5	81·6	3·6
10 gr. fat	..	..	..	..	..	0·1	8·5	..	78·7	2·8
e. Potato salad with sausage—										
600 gr. potatoes	..	..	..	..	..	9·0	1·2	120·0	534·0	6·5
10 gr. oil	..	95·0	..	883·5	240	..	9·5	..	88·4	2·4
100 gr. sausage	15·7	15·2	0·3	219·0	160	15·7	15·2	0·3	219·0	16·0
Tea, *cf.* Sunday	..	..	..	..	..	..	..	9·9	39·8	1·2
						88·7	39·7	560·0	3,034·6	56·7

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Foodstuffs. — *mo.* = morning. *mi.* = midday. *e.* = evening.	Percentage Contents.					Total Contents.				
	Protein.	Fat.	Carbo-hydrate.	Calories.	Price per Kilog. in Pfennigs.	Protein	Fat.	Carbo-hydrate.	Calories.	Cost in Pfennigs.
Total.						Gr.	Gr.	Gr.		
Sunday	..	..	..	..	..	90·3	23·6	487·4	2,603·3	75·6
Monday	..	..	..	..	..	86·3	30·7	516·4	2,758·5	55·9
Tuesday	..	..	..	..	..	90·5	25·6	484·3	2,610·8	50·4
Wednesday	..	..	..	..	..	89·7	35·7	495·6	2,749·1	60·1
Thursday	..	..	..	..	..	86·2	28·2	516·4	2,735·6	53·1
Friday	..	..	..	..	..	98·8	26·2	503·8	2,730·7	51·2
Saturday	..	..	..	..	..	88·7	39·7	560·0	3,034·6	56·7
						630·5	209·7	3,563·9	19,222·6	403·0
Average for one day	..	..		..	..	90·1	30·0	509·1	2,746·1	57·6
Seasoning, carriage	..	..		..	..	..	..	..	..	5·0
Cost of daily nourishment, without bread	..	..	..	..	..		..	..	..	62·6

RAW MATERIALS.

360 gr. meat with bones.	1,525 gr. fresh and preserved vegetables.	130 gr. potato flour.
100 gr. sausage.	40 gr. dried vegetables.	160 gr. corn flour.
350 gr. fish.	100 gr. jam.	50 gr. bean flour.
150 gr. herrings.	50 gr. dried fruit.	210 gr. sugar.
80 gr. nutritious residue.	150 gr. beans.	14 gr. tea.
100 gr. cheese.	100 gr. barley groats.	40 gr. cocoa.
20 gr. skim milk powder.	200 gr. maize groats.	4 gr. coffee.
100 gr. fat and oil.	135 gr. soya meal.	7 gr. chicory.
9,660 gr. potatoes.		10 gr. seasoning.

Prisoners of war performing heavy labour may be given an increase of bread in the same quantity as free labourers of the same kind. They should receive more savory food, with increase of meals and increased allowance of meat, fat, fish, pulse, and vegetables. The nutritious contents must be at least 10 per cent. higher than in the case of non-working prisoners of war.

N.B.—The amounts of vegetables, fruit, and potatoes do not take into account parings and peel; 20 per cent. more is to be applied as raw material and the cost calculated accordingly, with an addition of 20 per cent.

Enclosure 4 in No. 1.

FOOD CALENDAR.

Days and Foodstuffs.	Amounts of Constituents. (Kilogrammes.)				Calories.	Calculated for Total Number of Men. (Grammes.)				Calculated for Number who took Food. (Grammes.)			
	Prot.	Fat.	Carb.	Cal.		Prot.	Fat.	Carb.	Cal.	Prot.	Fat.	Carb.	Cal.
Friday, April 14.													
Kilog.													
Coffee .. 25	..	..	..										
Chicory .. 5	..	..	..										
Sugar .. 80	..	..	80										
Milk (litre) .. 75	2·62	0·75	3										
Potato .. 2,100	31·5	4·2	420										
Fish, fresh, net.. 1,140	205	..	..										
Salt 200	..	..	..										
Quaker oats .. 75	6·7	0·7	52	..	6,508,680	85	3·7	343	1,760	125	5·5	515	2,645
Milk, dried .. 10	2·3	2	3·7										
Bread (unlimited) 1,500	64·5	6	709·5										
	312·6	13·6	1,268										

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Days and Foodstuffs.			Amounts of Constituents. (Kilogrammes.)				Calories.	Calculated for Total Number of Men. (Grammes.)				Calculated for Number who took Food. (Grammes.)			
			Prot.	Fat.	Carb.	Cal.		Prot.	Fat.	Carb.	Cal.	Prot.	Fat.	Carb.	Cal.
Saturday April 15.		Kilog.													
Coffee	..	30	..	..	..										
Chicory	..	5	..	..	..										
Sugar	..	80	..	..	80										
Milk (litre)	..	75	2·62	0·75	3										
Potato	..	2,000	30	4	400										
Sardines	..	32	8·6	10	..										
Quaker oats	..	10	0·9	0·1	7										
Lentil meal	..	20	3·3	0·1	8·9										
Peas, dried	..	80	13·1	0·5	35·5										
Kohlrüben	..	700	4·9	1·4	38·5	..	5,966,040	36	19	331	1,615	69	35	631	3,075
Bacon	..	64	5·5	44·3	..										
Rice ..	..	10	0·6	..	7·4										
Macaroni	..	20	1·8	..	14·6										
Bread (unlimited)		1,500	64·5	6	709·5										
			132·6	67·2	1,224·4										
Sunday, April 16.															
Coffee	..	25	..	..	..										
Chicory	..	5	..	..	..										
Sugar..	..	38	..	..	80										
Milk (litre)	..	75	2·62	0·75	3										
Potato	..	2,000	30	4	400										
Milk, dried	..	10	2·3	2	3·7										
Rice ..	..	5	0·3	..	3·7										
Cocoa..	..	30	9·3	13·6	19	..	6,737,140	54	30	335	1,820	97	55	605	3,335
Beef ..	..	450	88	40	4·5										
Margarine	..	50	..	45	..										
Bread (unlimited)		1,500	64·5	6	709·5										
			197	111·4	1,224										
Monday, April 17.															
Coffee	..	25	..	..	..										
Chicory	..	5	..	..	..										
Sugar	..	80	..	..	80										
Milk (litre)	..	75	2·62	0·75	3										
Potato	..	600	9	1·2	120										
Milk, dried	..	10	2·3	2	3·7										
String beans	..	600	11·5	1·2	32·4										
Cocoa..	..	30	9·3	13·6	19										
Corned beef	..	235	45	23	..	..	5,036,080	42	15	262	1,360	62	23	390	2,030
Blood sausage	..	65	9·75	10	0·2										
Bread (unlimited)		1,500	64·5	6	709·5										
			153·9	57·–	968										
Tuesday, April 18.															
Coffee	..	25	..	..	..										
Chicory	..	5	..	..	..										
Sugar	..	43	..	..	43										
Milk (litre)	..	75	2·62	0·75	3										
Potato	..	2,000	30	4	400										
Fish, fresh, net..		1,100	198	..	..										
Quaker oats	..	75	6·7	0·7	52	..	6,192,650	81	3·1	325	1,675	135	5	540	2,770
Tea ..	..	5	..	..	..										
Bread (unlimited)		1,500	64·5	6	709·5										
			300	11·5	1,207										

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Days and Foodstuffs.	Amounts of Constituents. (Kilogrammes.)				Calories.	Calculated for Total Number of Men. (Grammes.)				Calculated for Number who took Food. (Grammes.)			
	Prot.	Fat.	Carb.	Cal.		Prot.	Fat.	Carb.	Cal.	Prot.	Fat.	Carb.	Cal.
Wednesday, April 19.													
	Kilog.												
Coffee .. 25	..	..	..										
Chicory .. 5	..	..	..										
Sugar .. 1,255	..	..	12·5										
Milk (litre) .. 75	2·62	0·75	3										
Potato .. 250	3·75	0·5	50										
Bücklinge .. 104	21·3	8	..										
Lentil meal .. 50	8·2	0·3	22·2										
Peas, dried .. 120	19·7	0·7	53·3										
Kohlrüben .. 700	4·9	1·4	38·5	..	4,517,840	35	12	240	1,220	76	28	530	2,690
Bacon .. 40	3·5	27·7	..										
Tea 5	..	..	..										
Bread (unlimited) 1,500	64·5	6	709·5										
	128·5	45·4	890										
Thursday, April 20.													
Coffee .. 25	..	..	..										
Chicory .. 5	..	..	..										
Sugar .. 45	..	..	45										
Milk (litre) .. 75	2·62	0·75	3										
Potato .. 2,000	30	4	400										
Fish, fresh, net .. 990	178	..	..										
Brathering .. 84	20	12·6	8·4	..	6,315,940	87	9	315	1,700	185	14	490	2,650
Cheese .. 86	29	9·5	4										
Tea .. .. 17·5	..	..	..										
Bread (unlimited) 1,500	64·5	6	709·5										
	324	33	1,170										
Averages	..	..	..	..	..	60	13	308	1,590	99	25	525	2,740

No. 2.

Sir Edward Grey to Mr. Page.

THE Secretary of State for Foreign Affairs presents his compliments to the United States Ambassador, and has the honour to refer to his Excellency's note of the 12th instant, transmitting copies of a report prepared by Dr. A. E. Taylor, in regard to the conditions of diet and nutrition in the British civil internment camp at Ruhleben.

Sir Edward Grey will be greatly obliged if the United States Ambassador at Berlin can be requested to be good enough to convey to Dr. Taylor the warm thanks of His Majesty's Government for this exhaustive statement, the preparation of which has necessarily involved much time and labour, and which furnishes information and suggestions of great value and importance.

Sir Edward Grey fears that the circumstances will not permit of the adoption in practice of the recommendations made by Dr. Taylor in regard to the establishment of an organisation, controlling the supply of food parcels sent to the camp from this country, but he would ask Mr. Page to inform Mr. Gerard that it is proposed to publish the report immediately, in the form of a White Paper, which will be communicated to the Prisoners of War Help Committee, with the request that it may be made known as widely as possible amongst the various societies and individuals by whom such parcels are now being despatched to Ruhleben.

Foreign Office, May 20, 1916.

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